

## 2006-07 TWRI Mills Scholarship Program

### 1. Name of Student and TAMU Student ID Number

Lisa J. Prcin

### 2. Name and Contact Information for Faculty Advisor or Committee Chair

Dr. Fred Smeins, Professor of Rangeland Ecology and Management  
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### 3. Description of the student's proposed research, emphasizing how it will address a water resources-related concern (one page or less).

#### **The Effects of Soil Fertility Enhancement on Disturbed Military Training Lands of Fort Hood, TX**

The Fort Hood Military Reservation opened in 1942, and in the subsequent 6 decades of heavy vehicle maneuver training, the landscape has become severely eroded due to military training activity. The reservation encompasses 88,000 hectares of land with over 26,000 hectares dedicated to vehicular maneuver training. It currently supports two armored divisions with more than 12,000 tracked and wheeled vehicles. The traffic pressure within the training areas causes substantial vegetation and soil disturbance leading to severe erosion. Fort Hood's eastern boundary is located directly adjacent to Lake Belton which is the primary water supply for more than 250,000 people in the surrounding communities. The sedimentation of Lake Belton from eroding training lands has been identified as Fort Hood's prime environmental concern. The Temple-Belton-Killeen area's current economic and population growth makes this water supply a precious commodity in need of protection.

Blackland Research and Extension Center (BREC) in conjunction with the Natural Resources Conservation Service (NRCS), Fort Hood Integrated Training Area Management (ITAM), and Texas Water Resources Institute (TWRI) are working to sustain training lands on Fort Hood and protect the water quality of Lake Belton. A primary interest of this collaborative effort is to increase the soil fertility on Fort Hood training lands which would aid in the reestablishment of vegetation cover which would in turn help mitigate the erosion problem.

As an employee of BREC and a graduate student at Texas A&M, my research focuses on investigating the effectiveness several soil amendments on soil fertility, comparing various methods of site preparation, and identifying native prairie plant species that work well on Fort Hood. BREC has established small replicated research plots on the disturbed training lands of Fort Hood, which I am

utilizing to carry out these evaluations. As well, I am conducting greenhouse experiments investigating the same practices in a controlled environment.

The soil amendments being evaluated are composted dairy manure, chemical fertilizer and wood mulch, which have been applied on disturbed areas of Fort Hood. In the spring of 2006, I implemented 3"x8" replicated field plots comparing compost to wood mulch and compost to chemical fertilizer. I have also established larger field plots (30"x100") in which the effects of site preparation, compost application and seed application will be studied. Vegetative responses to these amendments are being measured on all plots through plant population counts, species diversity, and biomass measurements. Soil fertility on all field plots is being monitored through pre and post application macronutrient content and pH. I expect to be able to recommend the treatment that most efficiently and quickly increases the fertility of the soil.

In addition to increasing soil fertility, Fort Hood is in need of a recommended seed mix for disturbed areas. Because of the continual disturbance of training areas, a native seed mix is needed that will germinate quickly and tolerate disturbance. I will investigate the seedling emergence and survival rates of several native plant species in response to soil amendments on Fort Hood

*5. Proposed use of funds resulting from this Scholarship (for example, to pay tuition, conduct research, etc.).*

As I continue my graduate degree, I will continue to live and work in Bell County (80 miles west of Texas A&M) and commute to College Station for classes. Because of this situation, the cost of fuel to travel to and from classes will be a burden on me. If I receive funding from the Mills Scholarship, it would defray my travel costs, pay for my student fees and purchase research supplies.

*6. Intended career path the student anticipates pursuing.*

After graduating with a Bachelor's in Animal Science, I took a position at Blackland Research & Extension Center, working in the water quality group. I began running storm-water samplers on Fort Hood Military Reservation monitoring the sediment loss from the training lands. I have since assisted in the *Re-vegetation of Training Lands through Compost Utilization Project* and the *Friar's Creek Restoration Project*.

Through these and other projects I have become more aware of the broad issues facing our most precious resource, water. After I obtain my Master's degree, I plan to continue working for Blackland Research and Extension Center in the water quality department. I would like to continue working in the area of rangeland and/or wetland restoration and remediation as it pertains to enhancing water quality, perhaps with a government entity or private consulting firm.